

The Ecological Rationality of Historical Costs and Conservatism

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Abstract:

The principles characterizing the traditional revenue-expense approach to accounting cannot be traced back to a distinct event. I argue that they are *ecologically rational*. Their functionality is the result of cultural evolution, not of unitary human design. This is the reason why the efforts to defend them against the balance-sheet approach endorsed by standard-setters have encountered severe difficulties. Only the latter is clearly based on a coherent model of the economy, namely neoclassical economics. It is further argued that a solid basis for explaining the rationale of the culturally evolved accounting principles can be found in behavioral economics. These principles are in line with human behavior as found in numerous laboratory and field experiments. It is especially with respect to Prospect Theory that a close parallel can be identified. I combine this observation with a market process view of the economy. Financial accounting according to the balance-sheet approach does not add new information to the market process; it only summarizes on the firm level information provided by the market. In contrast, the revenue-expense approach provides private information to the market à la Hayek (1945). The revenue-expense approach thus turns out to be congenial to the organization of the market economy.

Keywords: Financial Accounting; Prospect Theory; Conservatism; Historical Costs; Ecological Rationality

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1. Introduction

Since the early 1970s, the Financial Accounting Standards Board (FASB) and the International Accounting Standards Committee (IASC), which later became the International Accounting Standards Board (IASB), have been trying to develop and enforce financial accounting standards that contrast strongly with the historically evolved accounting principles (Littleton 1933; Ijiri 2005: 261; Biondi 2011a). For many and diverse reasons, the displacement of the old principles has been criticized severely. In a series of recent papers, Dickhaut et al. (2010), Dickhaut et al. (2009), Dickhaut (2009), and Waymire (2014) provide new arguments against the abolishment of these principles in favor of those advocated by the two main accounting standard-setters. They show that some of the most important accounting principles connected to the traditional revenue-expense approach, namely the historical cost principle and conservatism, are compatible with the results of neuroscience. These culturally evolved principles, they argue, must have a deeper meaning as they can be rediscovered in the logic of the human brain.

The present paper substantiates this claim. Tying on recent research by Waymire and Basu (2007, 2011), Basu (2009), and Sunder (2005), it tries to illuminate the rationale behind the evolution of the traditional accounting principles. It finds that there is indeed more behind these principles than mere tradition and that they are in no way arbitrary. There are systematic similarities between them and other aspects of human thought and conduct. Especially behavioral economics provides a fertile playing field, complementary to neuroscience, for those who look for instances where the logic of these principles pops up in relevant contexts.

The historical cost principle and conservatism are common features of human behavior. It is argued that this parallel is no coincidence. Although the behavioral traits which correspond to these principles are sometimes described as irrational or as anomalies, they appear to confer an evolutionary advantage to those who adhere to them in an uncertain environment.

Put into the context of a process of trial-and-error, the “irrational” principles seem to make a lot of sense. Historical costs, e.g., although they are sunk costs, help to generate information concerning the magnitude of both positive and negative consequences of past decisions, and conservatism might not guarantee profit-maximization, but it enhances the probability of surviving rough times. The traditional accounting principles can therefore still be rational even if they have never been rationally designed by anyone. Their rationality is, in the terminology of Vernon Smith (2003), *ecological*, that is, the unconscious result of an evolutionary process where behavior gradually adapts to the environment.

The argument of this paper consists of two parts. First, it is argued that financial accounting, if conducted according to the historical cost and conservatism principles, conforms to established results of behavioral economics. The relevance of psychology and behavioral economics for accounting research has been pointed out before (e.g. Koonce and Mercer 2005; Fennema and Koonce 2010). With the exception of Hirshleifer and Teoh (2009), however, the results of these disciplines have only cursorily been applied to the design of accounting principles. Therefore, in chapter 3, a relationship between the traditional principles and behavioral economics is established. The standard-setters de-emphasize conservatism and the historical cost principles because they cannot be reconciled with the normative assumptions of neoclassical economics. Even some leading members of the Austrian and the institutional schools of economics, which usually oppose modern neoclassicism, have contributed to this development (3.1). However, the traditional accounting principles do conform to the results of behavioral economics. They are in line with human behavior as found in numerous laboratory and field experiments. This paper concentrates on Prospect Theory (Kahneman and Tversky 1979), an experimentally cemented theory. It provides a background against which the principles can be interpreted in a new way. The traditional revenue-expense framework can be reconciled with this theory whereas the balance-sheet approach endorsed by the standard-setters cannot be so (3.2). The sunk cost argument that is

often brought up against the traditional way of accounting is also weakened by Prospect Theory and subsequent experiments. People do not forget about sunk costs, as neoclassical decision theory assumes, but keep them in mind (Thaler 1980, 1999). The same is done in classical accounting. Historical costs are not forgotten but kept track of in the balance sheet (3.3). Furthermore, the asymmetrical value function developed in Prospect Theory is consistent with the accounting principle of conservatism (Dickhaut et al. 2010) (3.4). Apparently, the traditional accounting principles align the behavior of enterprises to the behavior of human beings. As long as businesses practice accounting according to traditional principles they determine performance figures in a way that conforms to human behavior as revealed in numerous experiments.

The second part of the main argument, which is expounded in chapter 4, consists in the explanation of why these principles, although conforming to modes of behavior that violate rationality as postulated by neoclassical economics, have nonetheless won through in the evolution of institutions. That the traditional accounting principles have evolved as they have, it is argued, is a signal for their *ecological rationality* (Smith 2003; 2005; 2008). As institutions that developed as a result of human action but not of purposeful human design (Ferguson 1767; Hayek 1967a; Waymire and Basu 2007; Sunder 2005), the ultimate rationale for their existence and their configuration does not necessarily have to be plainly obvious (4.1). The traditional accounting principles are rather the unplanned outcome of a long trial-and-error process where different rules have been put to the test. Most notably after economic and financial crises there has regularly been a clear tendency towards historical cost accounting and conservatism (4.2). Apparently, the traditional accounting principles rest upon rules of conduct which ensured the survival of our ancestors and which therefore also increase the probability of surviving on the market (Waymire and Basu 2011; Basu 2015). Furthermore, whereas conservatism and the historical cost principle are not in line with neoclassical economics, they are all the more reasonable from a market process point of view.

The coordination function of the market does not necessitate the participants to have complete or perfect, but only *private* information in terms of Hayek (1945). Financial accounting according to the traditional revenue-expense approach provides new and private information to the market process, whereas the balance-sheet approach does not add new information to the market; it only summarizes on the firm level information provided *by* the market (4.3). IASB and FASB inhibit the processes that are necessary for ecologically rational accounting principles to evolve. They tend to intentionally design their standards and furthermore aim at uniformity all over the world. In this way, competition between different principles is more or less excluded and the ability to learn from experience becomes constrained (Dye and Sunder 2001) (4.4).

In bringing together two separated strands of literature – behavioral economics and the ecological rationality of institutions – and applying them to the issue of financial accounting, the present paper contributes to an understanding of the rationale of the traditional accounting principles. The paper starts out, in chapter 2, with a short presentation of the two visions of accounting that are relevant for the following discussion: the traditional view and the one endorsed by the standard-setters.

2. Two approaches to the function of accounting

Financial accounting, as was argued by Werner Sombart, Max Weber, Ludwig von Mises, and Joseph Schumpeter, is a central – if not the defining – institution of the market economy or capitalism (Waymire and Basu 2007: 3). Mises (1920) argued famously that socialism is doomed to fail because it cannot draw on what he called “capital accounting.”¹ The roots of accounting, as it is known today, go back at least to medieval Italy where, in 1494, Luca

¹ In a sense, it might therefore be said that financial accounting not only adapts to its socioeconomic environment, but that it conversely also has the potential to influence and change this environment. This paper does not follow up on this idea but rather focuses on how and why the principles of accounting evolved as they have.

Pacioli published the first printed description of double-entry bookkeeping, as practiced in the prosperous Italian cities of his time (Hatfield 1924: 6 ff; Zan 1994: 263; Sangster 2010).

In the last 150 years, the way this ancient and essential institution is approached by academics and politics has changed fundamentally. Whereas in earlier times the role of accounting research and commercial legislation was to describe and establish what actual sound accounting practices were, without actively interfering, the trend is towards the enforcement of accounting principles that run contrary to age-old traditions. In the 19th century, this trend showed itself markedly in Germany where, in two steps between 1861 and 1870, the German Commercial Law abolished the established historical cost rule and instead imposed what today would be called fair value accounting on corporations (Hoffmann and Detzen 2013). After having been realized that this step severely increased the exuberance and the frauds that preceded the crisis of 1873, the law was changed again and the traditional rules came into their own once more (Braun 2014). During the last forty years, the trend towards the authoritative establishment of mandatory accounting principles has gathered pace (Biondi 2011a: 2). Especially since the foundation of the FASB and the IASC, the traditional principles are shrinking in importance and are, bit by bit, being replaced by designed principles.

Although there are a lot of detailed changes that deserve closer treatment, this paper focuses on the big picture, that is, on the fundamental difference between the traditional accounting principles and the ones that are designed by the two big standard-setters. This difference shows up in the way the very function of financial accounting is interpreted. There are basically two alternative approaches (Dichev 2008: 454).

The *traditional* accounting principles evolved in a way that made them fit to determine the *profit* of the bookkeeping entity (Littleton 1953: 18-35). First and foremost, Eugen Schmalenbach ([1919] 1959; see also Dichev 2008: 455) worked out this relation. He argued that the one central function of accounting, if accomplished according to the traditional

historical cost principle, is to determine the success of the company by contrasting incurred expenses and collected revenues, and he concluded that, therefore, the income statement must be seen as the decisive document in financial accounting (Schmalenbach [1919] 1959: 32). The balance sheet, on the other hand, where the assets and liabilities are stated, only has a subordinate function. It has become necessary because most enterprises, especially since the industrial revolution, are going concerns, not one-shot undertakings with a foreseeable date of liquidation. For going concerns which pay out profits to their shareholders on a regular basis, and not only at the time of liquidation, it is necessary to keep away from the income statement all transactions that have not yet been completed, that is, for which profit cannot yet be determined. This includes most notably current expenses that are supposed to give rise to revenues in the future and current revenues that imply expenses in the future.

Thus the balance sheet, as interpreted by Schmalenbach ([1919] 1959: 55), serves as a store of unexpired items for the income statement. It is, in his own words, a “valuable aid to memory and so to speak depicts the power storage [Kräftespeicher] of the enterprise“ (Schmalenbach 1933: 121). It contains, to give a short example, the historical expenses that have been made for a durable machine. These only enter the income statement over the years, as depreciations, while the machine wears off.

Schmalenbach called this traditional view of accounting the “dynamic” approach. In this paper, it will be referred to as the *revenue-expense approach*. Gino Zappa and his school developed similar ideas in Italy at around the same time (Canziani 2013: 75-79). The revenue-expense approach reached its epitome in the United States with the publication of Paton and Littleton (1940) which also focused on the income statement and relegated balance sheet considerations to a “peripheral status” (Dichev 2008: 455; see also Mattessich 2013: 20). Paton and Littleton (1940) strongly influenced and shaped accounting thought and practice up to the present day, both in the United States and worldwide (Markarian 2013: 321-324; 2014: 47).

IASB and FASB, in contrast, promote what Schmalenbach called the “static” approach, which is today rather labeled the *balance-sheet approach* (Perry and Nölke 2006: 563) or the *asset-liability approach*. The main purpose of accounting, according to this view, is to provide useful and relevant information to the capital market, i.e., mainly to current and potential investors (Barth 2006: 272; Hitz 2007: 327). Therefore, in the view of accounting that the standard-setters are propagating and enforcing, the balance sheet is the crucial document. It contains – or is supposed to contain – useful information concerning the financial position of the company. It should ideally provide the “fair value” of all assets and liabilities of the company. Fair value accounting thus fits into the development towards the balance-sheet approach (Hitz 2007: 328). The fair value of assets and liabilities is supposed to provide information on the *present value* of the future cash flows that the respective items are expected to create (Biondi 2011a). IFRS 13.9 stresses the market basis of the fair value concept by specifying that the fair value is the “price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date.” In sum, “fair value” basically means the *present value* of the cash flows that the items in the balance sheet are going to produce and for which the price in an efficient market is the best proxy (Barlev and Haddad 2003: 397).

Should market prices not exhibit sufficient quality – for example because the underlying market is thinly traded – or not be available at all, standard-setters require using (modified) market prices of comparable items, where comparability refers to the cash flow profile. When marking-to-market is impossible, as a technique of last resort the fair value must be estimated using internal estimates and calculations (marking-to-model) (Hitz 2007: 326 f.). To sum up, the balance-sheet is not interpreted as a store for the income statements, but as a device that contains forecasts of future cash-flows.

As for the standard-setters the main purpose of accounting is to inform the capital market, the old revenue-expense view is opposed. A balance sheet based on historical costs does not

provide a fair picture of the “real financial position” of a firm (Barlev and Haddad 2003: 384-387). Further, according to the balance sheet approach, income only plays a derived role (Dichev 2008: 454). Comprehensive income is the difference between the present value of the company’s net assets – as determined by the fair value balance sheet – at the beginning of the period and their value at the end of the period (Barth 2006: 272; Rayman 2007: 217). So the balance sheet is no longer the “servant” of the income statement but, rather conversely, the income statement is only a correlate of the balance sheet.

3. Prospect Theory and its relationship to accounting principles

3.1 The neoclassical roots of the current standards

Economics and accounting have cross-fertilized each other for a long time. Originally, it was economics that took over many important concepts, like ‘capital,’ ‘costs,’ and ‘revenues,’ from accounting practices (Klamer and McCloskey 1992; Chiapello 2008). However, roughly since the 1960’s, the direction of influence has reversed (Dillard 2008). Concerning its method, modern mainstream accounting research is oriented towards the positive research program of economics (and later finance) which was advanced by Paul Samuelson and John Hicks (Kohn 2004) and famously summarized and motivated by Milton Friedman (1953) in his methodological essay (Watts and Zimmerman 1986; Basu 2015: 244 f.). With the rise of the new method, also crucial concepts like the efficient market hypothesis and Walrasian general equilibrium entered accounting research from economics, mostly via financial economics (Williams and Findlay 1980: 133-135).

It has been noted many times that the balance-sheet approach to accounting, and especially the concept of fair value, are based on neoclassical economics (Hitz 2007: 327, 332). Especially John Hicks’ (1946) discussion of income is used as a reference point by standard-setters (Bromwich et al. 2010: 350). They explicitly aim at John Hicks’ income concept N° 1

(Barth 2006: 280) which is often also called “economic income” (Solomons 1961: 375 f.). Hicksian Income N° 1 is

the maximum amount which can be spent during a period if there is to be an expectation of maintaining intact the capital value of prospective receipts (in money terms) (Hicks 1946: 173).

This concept of income clearly gives priority to the balance sheet and the valuation of assets and liabilities. According to Bromwich et al. (2010: 351; see also Solomons 1961: 376), Hicksian Income N° 1 is the difference between the firm value (net present value of a firm’s future cash flows) at the end of a period and the firm value at the beginning of the period plus the dividends distributed between those dates. Thus income is only a derivative of the determination of the present value of the firm’s assets and liabilities.

What has just been said does not imply that neoclassical economists necessarily or even regularly endorse the use of their equilibrium concepts, like Hicksian Income N° 1, in practice. Brief (1982) and Jameson (2005) show that even Hicks himself was actually in favor of the revenue-expense rather than the balance-sheet approach. The point is that both FASB and IASB hold John Hicks as a “foundational authority” (Jameson 2005: 331) and, ignoring his caveats, focus on his income concept N° 1.

It should be clear that neoclassical concepts and theories do not and are not supposed to rest upon realistic assumptions (Friedman 1953). If one promotes Hicksian Income N° 1 as the “correct” income concept, as standard-setters do, one implicitly assumes perfect competition, complete information, and rational actors, to name the most relevant ones. In other words, one assumes that there are markets for all relevant assets and liabilities and that these markets are efficient and actually in equilibrium (Beaver and Demski 1979: 39-43; Hitz 2007: 332). Otherwise, the present value of the firm’s assets and liabilities could not be determined – nor

even defined – in a meaningful way, which is admitted even by adherents of the fair-value program (Barlev and Haddad 2003: 405 f.). Therefore, in adopting the neoclassical framework, standard-setters also accept the latter's focus on equilibrium analysis.

It is important to note at this point that the demand for the balance-sheet approach and fair value, when it comes to accounting, is shared even by schools of thought which otherwise decidedly criticize the equilibrium approach of neoclassical theory. This might explain why there has been little fundamental criticism of the new approach to accounting from academic economics: even the opponents of neoclassical theory are quite neoclassical so far as accounting is concerned.

It is of special interest in this regard that the Austrian School of Economics, to which the concept of ecological rationality – made amply use of in this paper – can partly be inferred, basically rejected the traditional valuation principles. Not only Fetter (1937: 9) and Hayek (1935: 275 f.), but of all people Ludwig von Mises, who otherwise vehemently stressed the importance of the market *process* as against the neoclassical restriction to *equilibrium* (Kirzner 1997: 61 f.), held a rather neoclassical view of accounting. Unlike Waymire and Basu (2010: 135) state, Mises (1966: 213) rejected the old business customs and the traditional provisions of commercial law because they “have brought about a deviation from sound principles of accounting.” Instead, he advocated an accounting income concept which pretty much resembles Hicksian Income N° 1:

In balance sheets and in profit-and-loss statements the result of past action becomes visible as the difference between the money equivalent of funds owned (total assets minus total liabilities) at the beginning and at the end of the period reported, and as the difference between the money equivalent of costs incurred and gross proceeds earned. In such statements it is necessary to enter the *estimated* money equivalent of all assets and liabilities other than cash. These items should be *appraised* according to the prices

at which they could *probably* be sold in the *future* or, as is especially the case with equipment for production processes, in reference to the prices to be *expected* in the sale of merchandise manufactured with their aid (Mises 1966: 212 f., emphasis added).

In this passage, obviously both the balance-sheet approach and the fair value concept shine through.

It is not clear which accounting theorists influenced Mises because, writing a general treatise on economics, he did not quote any author in support of his views. Yet, his point of view is especially important because of *his* influence on Raymond Chambers. As Gaffikin (1989: 90) writes, Mises was “one of Chambers’s main sources of inspiration.” Chambers is sometimes referred to as the father of fair value – although this certainly is an exaggeration (Gaffikin 2012; Barlev and Haddad 2003: 390). In any case, he was an influential accounting theorist in the 20th century strongly putting emphasis on the rationale of fair value accounting. His magnum opus, Chambers (1966), not only quotes Mises more often than any other economist, but reminds of Mises both because of its deductive approach and its multidisciplinary. Consequently, Chambers’s (1966: 112-115) discussion of income as the change of the value of net assets between two points of time is clearly based on Mises (1966: 212-214).

Ronald Coase might be mentioned as another famous critic of neoclassical theory – and especially of its extensive use of unrealistic assumptions (Medema 2008: 432-435) – who was nonetheless quite neoclassical when it came to accounting. In Coase (1990: esp. 8) he explains how he and his young colleagues at the London School of Economics in the 1930s were fighting against accountants in order to establish their new opportunity cost concept in accounting. In financial accounting, of course, the opportunity cost of an asset is its exit value, that is, the price for which it could be sold on the market – and thus its fair value (Ronen 2008: 186; see also Buchanan 1999: 26-29).

To sum up, the standard-setter's vision of financial accounting is based upon neoclassical economics. What is more, even other notable schools of economics do not oppose this vision so that it is no wonder that accounting has been a victim of economic – better: neoclassical – imperialism. In economics, there was no elaborated alternative framework available.

3.2 Prospect Theory and the Balance-Sheet Approach

The assumptions of neoclassical economics have been attacked since they were first formulated. In the second half of the 20th century, a prominent opponent was the then new field of behavioral economics. Psychologists and economists showed that real people making actual decisions do not choose in accordance with rational choice theory. One of the most notable outcomes of this research program, and one that is especially relevant for our discussion of accounting principles, was Prospect Theory (Kahneman and Tversky 1979). It reported conclusive evidence that the majority of people do not act according to the Expected Utility Theory. In their classic paper, Kahneman and Tversky argue that human valuations do not relate to final states of wealth, as in Expected Utility Theory, but to changes in wealth.

[P]eople normally perceive outcomes as gains and losses, rather than as final states of wealth or welfare. Gains and losses, of course, are defined relative to some neutral reference point. The reference point usually corresponds to the current asset position, in which case gains and losses coincide with the actual amounts that are received or paid (Kahneman and Tversky 1979: 274).

Due to the S-shaped value function assumed in Prospect Theory, this implies that the mere framing of certain outcomes as gains or losses may change the behavior of people (Biondi and Marzo 2011: 423 f.). These “departures from expected utility theory,” Kahneman and Tversky

(1979: 277) add, must lead to “normatively unacceptable consequences, such as inconsistencies, intransitivities, and violations of dominance.”

From the way they formulated their point, however, something different can be also inferred. The balance sheet approach to accounting, whereas it is compatible with neoclassical economics, seems to run contrary to the empirically derived Prospect Theory. For individuals, final states of wealth are not “carriers of value” (Kahneman and Tversky 1979: 277). Human behavior, in other words, is not consistent with Hicksian Income N° 1. The latter interrelates two – independently valued – states of wealth (i.e., the net values of all assets), the difference being income. Apparently, this way of calculating income is different from what Prospect Theory shows for actual human decisions. According to this, the asset position at the beginning serves as a reference point. Gains and losses are “the amounts of money that are obtained or paid” (Kahnemann and Tversky 1979: 286), not the difference between the current asset position and a future one (Fennema and Koonce 2010: 6).

Rather, Prospect Theory is compatible with the traditional revenue-expense approach to accounting. By calculating with historical cost, this approach creates a reference point in the balance sheet: the original amount of money that has been paid for the firms’ assets (Hirshleifer and Teoh 2009: 1078). These assets are not valued anew each period, but are instead carried forward at their historical cost. Income is created when, starting from this amount of money documented in the balance sheet, the money inflows are larger than the outflows (which can also include write-offs from the original price of the assets). Thus the comparison between Prospect Theory and the revenue-expense approach tells us that the latter might be an adaptation to the way humans evaluate the gains and losses of their actions. It could be interpreted as a translation of human behavior to the firm level by means of the institutions of economic calculation and financial accounting.

The interpretation of the firm as an entity which “behaves” similar to actual human beings is congenial to the approach presented and developed by Biondi (2005). In an early but very

concise statement which points in this direction, Sombart (1919: 119) argued that it is one of the main purposes of double-entry bookkeeping to create of a separate, acting entity. By means of accounting, the enterprise “assumes a separate existence” and becomes “an entity which emerges as a subject conducting individual economic acts and which leads a separate life, outlasting the life of individuals” (Sombart 1919: 101). It appears that financial accounting according to the principles of the revenue-expense approach makes the actions of this separate entity look like as if it were subject to Prospect Theory.

It goes without saying that caution must be exercised in drawing this parallel. The accounting system might establish the firm as an enterprise entity, but it must not be forgotten that this entity is still a “socioeconomic field” whose representation, organization, and governance require a separate analysis (Biondi 2013b: 404).

3.3 The role of the endowment effect and sunk costs

Richard Thaler (1980) elaborated on Prospect Theory in order to demonstrate further failures of neoclassic economic theory to describe and predict behavior. Among other things, he built upon an old result of social psychology (e.g. Markowitz 1952) that Kahneman and Tversky had integrated into their theory. It had been shown that human decision-makers *weigh* changes in their endowment differently according as they are losses or gains. “The aggravation that one experiences in losing a sum of money appears to be greater than the pleasure associated with gaining the same amount” (Kahneman and Tversky 1979: 279). Thaler’s (1980) subsequent discussion of sunk costs and the endowment effect backs the argument of the last section. Apparently, decision makers regard historical costs as actual or potential *losses* and therefore weigh them more than exit values which they see as foregone gains.

According to economic theory, all costs are opportunity costs. The cost of any decision is supposed to be the highest valued opportunity forgone. The out-of-pocket costs, i.e., direct

outlays of cash, do not have any independent meaning as they are interpreted as opportunity costs as well – the highest valued opportunity that would have been obtainable with the cash given away. As indicated in section 3.1, the depiction of opportunity costs in the balance sheet is a more or less explicit ideal of the fair value program. Thaler (1980: 44), however, points out that, in real life, decisions are influenced by the *endowment effect*. It makes a difference whether costs have actually to be incurred or simply consist in foregone opportunities (Biondi 2011b: 1031 f., 1039-1042). To illustrate this point, it is not the same to someone whether they need only to *choose* between two options, e.g. between a bottle of wine and \$5, or whether they have to *actively* give away one option, e.g. when they have to pay \$5 for a bottle. The fact that they are “endowed” with the \$5 makes them more reluctant to choose the bottle of wine although, from the standpoint of Expected Utility Theory, the decisions seem to be the same.

Thaler (1980: 44) argues that this observation can be explained by means of Prospect Theory. Starting from the reference point, that is, from the actor’s initial endowment with assets, out-of-pocket costs are viewed as losses (and therefore felt intensely) whereas opportunity costs are viewed as foregone gains (and therefore felt more mildly). This explains why out-of-pocket costs loom larger than opportunity costs.

Obviously, “out-of-pocket costs” is just a different name for “historical costs.” Historical costs in the balance sheet document what the firm has invested in so far. They could also be called the “endowment” of the firm. So, although the endowment effect *should* not influence decision-making, according to neoclassical theory, endowments *are* important in actual human decisions. And the traditional accounting principles do nothing else than to accept this empirical fact and translate it to the firm level.

Thaler’s (1980) discussion of sunk costs underlines this parallel. He explicitly states:

Economic Theory implies that only incremental costs and benefits should affect decisions. *Historical costs should be irrelevant* (Thaler 1980: 47, emphasis changed).

Based on the observation of human behavior, however, he suggests that economic theory is not descriptive in this point. Instead, he offers an alternative hypothesis. Costs that have been incurred in the past are not irrelevant to the present.

[P]aying for the right to use a good or service will increase the rate at which the good will be utilized, *ceteris paribus*. This hypothesis will be referred to as the sunk cost effect (Thaler 1980: 47, emphasis erased).

Interestingly, Thaler (1980) draws on metaphors taken from accounting when he explains this effect. Sunk costs, he says, are not felt as pain at the time when they are incurred. Instead they are memorized in the “individual’s psychic account system” until the moment comes when the corresponding revenues accrue (Thaler 1980: 48; Thaler 1999: 190-192 and Okada 2001 report supporting experimental evidence). Only then the net gain or net pain is felt. He uses the example of a family who pays \$40 for baseball tickets. He argues that no pain or pleasure will be felt at the moment of purchase. Only when the day of the game arrives will there be a comparison between the \$40 and the pleasure derived from watching the game with the family feeling “net pleasure” (Thaler 1980: 49). The similarities between his findings and traditional accounting are so apparent that Thaler cannot but recognize them (see also Shafir and Thaler 2006; Fennema and Koonce 2010:10 f.). The historical cost process in financial accounting does not ignore sunk costs, as Expected Utility Theory would assume, but seeks to recover them over time thus creating an interdependency through time periods.

It has been argued that the endowment effect, and thus the sunk cost effect, disappears with market experience (List 2003). If this indeed were the case, the endowment effect would be a

behavioral anomaly that could only be found in (unexperienced) consumers, not in business life. It would be difficult, therefore, to trace accounting principles, which regulate *business* actions, back to this effect. However, in a recent study, Apicella et al. (2014) have established the reverse relationship. According to an experiment they conducted with isolated hunter-gatherer people (the Hadza Bushmen of Northern Tanzania), subjects without prior exposure to the market do not exhibit the endowment effect, whereas those who have gained market experience actually do. Their findings empirically support Huck et al. (2005) who have shown that, under certain conditions, the endowment effect might provide an evolutionary advantage in trade. As, according to this, the business environment might even be a trigger of the endowment effect, the parallel indicated by Thaler between human behavior and accounting seems to be all the more justified.

3.4 Prospect Theory and Conservatism

Basu (2009: 15) and Dickhaut et al. (2010: 243), in their discussion of the relevance of Neuroscience for accounting theory, already briefly highlight another aspect of Prospect Theory. They state that the asymmetry between gains and losses which shows up in human behavior strongly reminds of the accounting principle of conservatism. Conservatism, the principle according to which the accountant anticipates no profits but all losses (Watts 2003: 208), goes back at least to the early 15th century (Basu 1997: 7 f.). Its best-known outgrowth is valuation according to ‘cost or market, whichever is lower.’ Although this valuation apparently violates the historical cost principle and interferes with the matching of expenses and revenues (Yamashita 1966: 3), it has nonetheless been integrated in revenue-expense accounting. Whereas critics of conservatism have stressed its “potential to garble earnings due to the asymmetry in the treatment of revenues and expenses”, and thus its irrational character, its supporters have often claimed that conservatism in accounting is simply a matter of

prudence (Harris et al. 1994: 191). Among other things, it saves companies (and their creditors) from distributing too high dividends (Watts 2003: 213).

Yet, it seems probable that conservatism is more than a mere *ad hoc* prudence device. As tests of Prospect Theory show, humans generally evaluate gains and losses differently. Barton et al. (2014), for example, have found that investors react asymmetrically to earning news in the way Prospect Theory predicts. Losses loom larger than gains, and it therefore seems sensible to treat them asymmetrically in financial accounting as well. The rule of conservatism reflects this asymmetry. In accordance with the fact that losses are felt intensively, conservatism demands that losses are recognized in the income statement as soon as they are anticipated. In other words, impending losses loom larger in the income statement than expected profits. The accounting principle of conservatism frames the information shareholders and/or managers of a company receive concerning gains and losses in a similar way ordinary humans do it in their everyday decisions.

4. The ecological rationality of the traditional accounting principles

4.1 Ecological and constructivist rationality

At first sight, our results so far are counterintuitive. It cannot be denied that there are good reasons for standard-setters to be oriented towards neoclassical economics. Many competent commentators regard accounting as a central institution of the market economy, and the modelling of the economic laws of the market is the main purpose of neoclassical economics, not of behavioral economics, at least not to the same extent. A major aim of economists in the latter tradition even seems to be the critique of the unrealistic assumptions their neoclassical colleagues have to make in order to be able to deduce these laws (Smith 2005: 144). Yet, our discussion has shown that the age-old accounting principles are closer to behavioral economics than to neoclassical economics. There is a parallel between the traditional way of practicing accounting and the way that humans actually behave.

Counterintuitive results are at risk of being dismissed as arbitrary. Different from the balance-sheet approach, which can be backed up with neoclassical economics, the principles of the revenue-expense approach cannot be simply deduced from a coherent theoretical system. There is a parallel to Prospect Theory, but this is thus far only an empirical finding.

Chapter 4 explains *why* it is the case that the traditional accounting rules do not conform to the neoclassical assumptions but to the behavior as described by behavioral economics. The argument is based on the distinction between two forms of rationality, most notably made by Vernon Smith (2003; 2008), but foreshadowed clearly by Menger (1892), Hayek (1967a; 1967b; 1978), and Simon (1981; 1990).

The first form is the conscious form of rationality that Smith calls *constructivist rationality*. It applies when a result is brought about purposefully by the action of an agent or an acting body. Behind constructivist rationality is the idea that “all worthwhile institutions were and should be created by conscious deductive processes of human reason” (Smith 2008: 26). The second form is *ecological rationality*. Smith (2008) argues that, sometimes, and especially in social contexts, the rationality of an outcome is not the consequence of a rational plan, but the unintended outcome of decentralized actions and interactions of unsuspecting individuals. Ecological rationality, then, is not due to human design but to the environment where the decisions are made and where they unfold their consequences in a self-coordinating process.

Following up some remarks by Waymire and Basu (2007: 93) and Basu (2015: 246), it will be argued that the traditional accounting principles are an *ecologically* rational institution. Even though they have never been rationally designed from scratch, they have turned out the way they have due to a cultural evolution. It appears they better guaranteed the survival of the applying firms, especially in times of economy-wide trouble, than other principles.

Section 4.2 explains in detail what is meant by ecologically rational accounting principles. The argument is not that they develop without any interference from research, law, or even standard-setting. It is rather that the process of finding high-quality accounting principles

must be open to empirical rebuttal, that is, to trial-and-error. The following section 4.3 outlines some conjectures as to why the traditional accounting principles have actually evolved the way they have. This step seems to be essential if we want to convince politicians, researchers, and standard-setters of our case for more ecological rationality in the development of accounting principles. We must be able to demonstrate *ex post* what exactly constitutes the fitness of the evolved principles. It will be argued that they are advantageous for the individual firm, but they also seem to be congenial to the functioning of the market economy as a whole. Section 4.4 finally points out how far the constructivist approach by FASB and IASB can be criticized based on these findings.

4.2 Accounting and its principles as an evolved cultural institution

In today's U.S. accounting textbooks, the history of financial accounting routinely starts in 1934, with the formation of the SEC, and its delegation of accounting standard-setting to private bodies (Sunder 2005: 373; Waymire and Basu 2007: 4; Basu 2015: 249). The shift towards legislated written and authoritatively enforced standards gathered pace in the early 1970's after the FASB Conceptual Framework project was launched. Biondi (2011a: 2) even speaks of an "accounting revolution." Accordingly, accounting researchers "almost exclusively use implicit theories of intentional design to analyze accounting practices, whether imbedded in regulators' conceptual frameworks or academics' comparative static analyses" (Waymire and Basu 2007: 1 f.). In other words, the constructivist view is thought to apply. Accounting principles are seen as a product of conscious deliberations and political decision-making processes. The standard-setters are supposed to be able to rationally design accounting rules.

It must be added that the policy of FASB and IASB to *converge* accounting standards and the *international harmonization* of practice, criticized by Sunder (2010), is a natural consequence of their general constructivist approach. If the standard-setters waited for the competition

between different standards to show which of them evolves as the more robust one, they would abandon implicitly their claim that it is possible to design accounting standards rationally and would therefore lose an important part of their *raison d'être*.

It is true: especially since the financial crisis broke out in 2007, but already before, a growing amount of critics had bemoaned flaws in the designed accounting standards. Notably the fair value principle has been said to be responsible for greater financial fragility of companies and banks and has been blamed for exacerbating market bubbles (Boyer 2007; Allen and Carletti 2008; Plantin et al. 2008; Dichev 2008: 466; Yuan and Liu 2011: 18-28). The standard-setters' policies have been criticized severely, and also the fact that the standard-setting process has been delegated to private bodies (Perry and Nölke 2006).

However, the constructivist view according to which accounting principles are and should be consciously designed has been challenged by but a few commentators. Sunder (2005: 373) worries:

At the beginning of the 21st century, few people seem to be aware of the social norm, convention, or common law approach of the earlier era, and such an approach has hardly any advocates left.

Sunder (2005: 372; 2010: 104) argues that the world of accounting did not have less order in the days before authoritative standards were set. There were business and professional norms that had developed over time and that regulated accounting in a more informal way. That the traditional accounting principles have not been consciously designed, but emerged spontaneously in a process of several centuries, is also argued by Littleton (1953: 2), Byrne (1965: 107), Huerta de Soto (2012: xxvi-xxix) and Waymire and Basu (2007: 1 f.).

To be sure, the argument is not that design and evolution of social norms are mutually exclusive and that, therefore, no traditional accounting principles have ever been designed by

anyone (Sunder 2005: 375 f.). There are good reasons why total dependence on either designed standards or purely evolved norms may not produce optimal results (Biondi et al. 2012: 129 f.). Obviously, the treatises of some famous writers, like Luca Pacioli or Jacques Savary, and, likewise, important legislative texts, like the French *Code de Commerce*, the Prussian *Allgemeine Landrecht*, or the British *Joint Stock Companies Act* of 1856 influenced accounting practices for centuries.

The point is that, throughout the course of history, numerous differing accounting principles that have consciously been designed have been put to the test, but only few of them stood the test of time and came down to our days. The process of trial-and-error and competition among different accounting regimes was allowed to eliminate those principles that adversely affected both the health of the businesses applying them and general economic welfare, so that the principles that won through were best adapted to guarantee the survival of the applying businesses and the health of the economy (Byrne 1965: 109; Salin 2010: 58; Basu 2015: 253). The research by Hoffmann and Detzen (2013) can demonstrate what is meant by this point. With the one exception of the post-WWII period, in Germany discretionary valuation always became popular during economic booms. In the subsequent downturns, however, loose regulation of asset valuation and the ensuing over-valuations were regularly identified as catalysts of excessive developments during the boom-phase, which resulted in several revisions of the trade law towards historical costs. As Hoffmann and Detzen (2013: 368) express it, legislation has been “crisis-driven” in that socio-economic events considerably influenced accounting regulation. Littleton (1933: 277) makes a similar case for Great Britain describing the usual sequence of events in the 19th century in the following way: “a financial crisis, extensive business failures, a new bankruptcy statute” (see also Waymire and Basu 2011).

According to Walker (1992), Zeff (2007) and Markarian (2014), something very similar happened in the U.S., where the SEC, in 1934, started with a very conservative viewpoint on

financial accounting due to the connections that some of its commissioners, most notably Robert Healy, saw between flagrant write-ups made during the boom of the 1920s and the severity of the following stock market crash of 1929. It is interesting to note that the epoch-making text by Paton and Littleton (1940) reflects this viewpoint clearly (Biondi 2013a: 363; Markarian 2014: 46). Paton and Littleton (1940) – and the influence it had on accounting thought and practice during the following decades – can therefore also be seen as the interim result of a trial-and-error process. It was an indirect outgrowth of the antecedent crisis.

4.3 Is a rational reconstruction possible?

The institution of accounting and its principles has actually evolved in a very long process. Nobody decided on the question as to which way of record-keeping is the best or most successful one. Instead, cultural evolution has shown which accounting principles have stood the test of time. However, as a consequence of the nearly exclusive emphasize of constructivist rationality in accounting research, “we understand virtually nothing about how the important institution of accounting evolves spontaneously” (Waymire and Basu 2007: 2).

But even though we are not able to determine why exactly accounting norms developed the way they did – as shown above, these norms were not purposefully designed by anyone – we may be able to rationally reconstruct some reasons for their evolution (Smith 2003: 470).

Of special interest is the question posed at the beginning of this chapter: Why did those accounting principles win through that resemble economic behavior as observed by behavioral economics, and not others which are more compatible with the assumptions of neoclassical economics? In what consists their fitness?

Unfortunately, no precise answer can be given, at least not yet. Social norms, as Sunder (2005: 371) rightly observes, “leave nary a footprint in the public record.” We can only conjecture that individual behavior which fulfills the assumptions of rational choice theory is not necessarily the behavior which prevails in evolution, neither for humans in the evolution

of species nor for companies in the social context of the market economy. Individual rationality might be important in some instances but it does not have to be the only or even the most important factor of success.

Take the example of sunk costs. Most of us know and understand the rationality of the argument of standard economics as to why sunk costs should not influence our decisions. Nonetheless, all of us have committed and continue to commit the “mistake” of not ignoring past costs in what we do, especially at times when we forget about the argument. Does this mean that we all are irrational? Could it not be that, for some yet unknown reason, those of our ancestors who did not ignore sunk costs had an edge over those who presumably were more rational? If this were the case, the fact that traditional accounting norms imply the use of sunk costs in the form of historical costs might indicate that this rule contains tacit knowledge that we have not yet any clear idea of. If life is seen as a trial-and-error process, for example, it is necessary for actors to be able to evaluate whether what they have done was an error or not and how damaging the error was. For this evaluation, they need an idea of what has been lost by following a special path of action. Sunk costs provide this kind of information. *Sunk costs, in so far as they cannot be recovered, inform decision-makers about the magnitude of their errors or, in case they are offset by gains, about the magnitude of their success.* They can thus serve as guideposts for successful future decisions.

The case seems to be clearer for conservatism. It is not inconceivable at all that, from an evolutionary perspective, it is a prudent code of conduct to lay more stress on the avoidance of pain than on the attainment of pleasure. Needless to say that survival is a *pre*-condition of enjoying pleasure and therefore the more important of the two. An accounting rule which makes the entrepreneur feel losses earlier than profits would likewise induce him to avoid losses more than he would otherwise do (Watts 2003: 213). It might be a rule that does not guarantee the short-term *maximization* of profit, but it might instead enhance the probability

of *positive* profits and thus continuity of business enterprise over time (Alchian 1950: 218; Waymire and Basu 2011: 218).

It goes without saying that this discussion only contains hints and conjectures on why the evolved accounting norms have become what they are. It should have become clear, however, that an argument can be made that they are *ecologically rational*. Although we do not yet completely understand how and why they work, we can see that *a deviation from them can lead to severe problems, especially during economic booms and depressions*. That is why they regularly reappear on the agenda despite ostensibly being not rational from a constructivist point of view. What remains to be done – and this is the major part of the work – is to reconstruct this ecological rationality in more detail.

It seems to be especially promising in this regard to analyze in how far the different accounting principles fit into the general framework of the market economy. What difference does it make for the economy as a whole according as companies apply the balance-sheet or the revenue-expense approach in accounting? Hayek's (1945) view of the working of the price system might serve as a starting point for the corresponding research program. He argued that neoclassical economics turns the rationale of the price system on its head. This system *does not presuppose* extraordinary amounts of knowledge or rationality on the part of the market participants, as neoclassical theory assumes. Instead, the price system *generates* knowledge about the relative scarcities in society. Every individual only needs the "knowledge of the particular circumstances of time and place" (Hayek 1945: 521), not more. Thus, private information is the input and public information is the output of the market process.

This view of the market process backs the traditional revenue-expense approach (Basu and Waymire 2010: 138 ff.). One could argue that it is not necessary nor even meaningful that the individual balance sheet contains *publicly* useful information. This kind of information is only

generated by the market process, and the input of this process is private information of the circumstances of time and place.

And this is exactly what income figures based on historical cost accounting reveal: private and new information. Historical costs inform us about the amount of money that has been paid by *one* particular firm for its asset at *particular points* in the past, and the corresponding income figures tell us how much profit this firm has made from these transactions. *Why* it did so remains its secret. Possibly, nobody else would ever have paid these amounts for these assets and earned this profit. Because of this, the profit thus revealed contains new and private information on the firm. It is based on the actual actions of the respective firm, and in its actions, a firm necessarily considers its specific “knowledge of the particular circumstances of time and place.” Thus, profit based on historical cost figures in income statements can serve as information *input* to the market process.

No new information is generated, however, when, as in fair value accounting, the *market value* of an asset is shown in the balance sheet and the increase of the market value in the income statement (Schildbach 2015: 79 f.). To depict the increase of the market value of an asset provides no new information to the market. *It is the result of the market process, that is, of the actions of the other market participants, not an information input of any sort.* From a market process point of view, Hicksian Income N° 1, the ideal of the adherents of the balance-sheet approach, does not provide new information but instead presupposes that the necessary information is already provided by the market (Sunder 2013: 1).

The argument according to which it is not meaningful to demand that balance sheets contain publicly useful information does not imply that information provided by the market should categorically be excluded from the balance sheet. The principle of conservatism with its *cost-or-market* rule is a case in point.

Generally, it can be said that the individual market participant’s attitude towards risk, losses, and gains, whether “rational” or not, is simply part of the private information that enters the

market process. There is no reason why the possibility to coordinate the plans of the market participants should depend on the anxiety with which they calculate their profit. Conservative plans can be coordinated in the same way as optimistic or realistic ones. The market outcome probably differs, but not its efficiency.

But even the cost-or-market rule, although partly relying on information provided *by* the market, can easily be reconciled with Hayek's view of the price system. If an asset is written down to its market price according to this rule, the corresponding changes in the income statement still provide new, private information to the market. The point is that the influence that a market price reduction of an asset has on a firm's income statement does not only depend on the price reduction itself, but also on the preceding book value of the asset. In a system of historical cost accounting, this value can differ considerably across firms, and the same goes for the resulting profit figures. Accordingly, the cost-or-market rule might influence the income statement of different firms in completely different ways, and to report these figures is therefore not redundant but provides new information to the market process.

4.4 Limits of the constructivist approach endorsed by the standard-setters

The arguments presented in the last section imply that the recent trend away from the revenue-expense approach and towards the balance-sheet approach should be reconsidered. There are reasons why the traditional principles developed the way they have. By substituting them with principles that comply well with the balance-sheet approach, standard-setters may be able to base their standards on the coherent system of neoclassical economics. But they also run the danger of compromising the financial soundness of firms and, contrary to their intention, of decreasing the usefulness of the information that accounting figures send to the market.

It must be made clear, however, that the defense of the historically evolved accounting principles and the critique of the balance-sheet approach do not aim at a mere return to the

former. The traditional principles have been the result of a long, evolutionary process, it is true, and they seem to be ecologically rational. But nobody knows where the evolution of accounting would lead in the coming decades and which principles would become necessary if the process of finding high-quality standards remained subject to cultural evolution.

What follows from the arguments presented in the present paper is rather a critique of today's standard-setting *process*. The monopolistic establishment and enforcement of uniform accounting standards in nearly the world over destroys the competition among different accounting principles not only on a national, but also on an international level. As Jamal and Sunder (2014: 383) remark in this context, “[m]onopolies are not known for their innovation.” Ecological rationality has been pushed back as a source of wisdom because the evolutionary trial-and-error process has been repressed as a source of information in terms of Alchian (1950: 219); instead, constructivist rationality has taken its place. There are at least three areas where the constructivist approach of FASB and IASB constrains the generation and processing of new and potentially important knowledge on matters of accounting principles.

First, they seem to ignore the results of past errors, that is, the historical evidence for the evolutionary dominance of the revenue-expense approach – its ecological rationality. Trial-and-error cannot work if trials are not being allowed to be classified as successes or failures. In this way, further (in an extreme case: continuous) painful empirical rebuttals of the balance-sheet principle are provoked and any progress is prohibited.

Second, in aiming at uniformity and by making their view mandatory the world over, standard-setters rule out the possibility to profit from competition between different accounting regimes. In order that competition can function as a “discovery procedure” (Hayek 2002), the results obtained with one system of rules must be comparable to what alternative courses of actions would have brought about. Without competition among different accounting systems, no alternative regulations can be put to the practical test. As a

consequence, it becomes much more difficult for standard-setters to identify advances – or regressions – in accounting principles (Sunder 2010: 106; Madsen 2013: 871 f.).

Third, already Baxter (1953) cautioned against the dangers of mandatory rules, even when they are set by benevolent standard-setters, for the progress of *accounting research*. He argued that the “hot debates on such matters as depreciation, income measurement, asset valuation, and the effects of changing price levels” vividly illustrate how difficult it is to know “where truth lies” in the design of accounting rules (Baxter 1953: 425). When there are mandatory standards, these questions are settled by authority and the discourse changes from the critical examination of the merits of alternative accounting rules and practices to the reproduction and discussion of written and preset standards. It is to be feared that this will decrease the potential for innovative research on fundamental questions – like on the improvement and the reform of the current standards. Furthermore, accounting research becomes less attractive for talented students because abstract and fundamental thinking is discouraged in place of black-and-white thinking (Sunder 2010: 108 f.).

A possible argument that qualifies these points could be that the standards are only mandatory for financial but not for managerial accounting, and that there is therefore no need for managers to make their decisions on the basis of the stipulated balance-sheet approach. However, if firms are forced to generate data that they do not need and use in their internal decision processes, costs are driven up considerably with little offsetting benefit. The standard-setting process would then seem to be superfluous and a questionable use of resources.

5. Conclusion

It would go beyond the scope of this article to present elaborate proposals for the reformation of the standard-setting process. Certainly, what Dye and Sunder (2001) brought up for discussion would allow for more ecological rationality in the process of developing high-

quality accounting standards. If different standards were allowed to operate side by side, both within and across legal communities, competition between them could function as a discovery procedure. The relative qualities of each standard could then be observed directly and compared; their assessment would not have to depend on mere arm-chair reasoning.

What the article has shown is that, independent of the concrete form of implementation, there is something to gain from opening the standard-setting process to cultural evolution. There is something behind the traditional accounting principles although they have never been purposefully designed from scratch.

The revenue-expense approach and especially the principles of historical cost and conservatism have been shown to bear a close resemblance to human behavior as demonstrated by Prospect Theory. Whether this is rational or not, people do not ignore sunk costs and they value gains and losses differently. Furthermore, they evaluate the results of their actions as changes relative to a reference point, not as the difference between two individually valuated states of wealth. In addition, it has been demonstrated that it does not necessarily have to be a problem when accounting is conducted according to principles which do not conform to the assumptions of neoclassical economics. In fact, they even seem to increase the chance of their users to stay in business. Also, that the revenue-expense approach primarily incorporates *private* information makes it congenial to a market process view of the price system.

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